SYPHILIS OF THE HEART AND AORTA

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OF the advances in modern medicine few are of more importance than those which have been made in our knowledge of the morbid changes and symptoms caused by syphilis of the vascular system. Syphilis has been known as a cause of aneurism for over two centuries, but it is little more than half a century since it was shown to be a cause of arteritis. In 1856 Sir Samuel Wilks first drew attention to syphilitic affection of the heart, and in 1868 Sir Clifford Allbutt gave the first description of the histological changes of syphilitis of the arteries. The knowledge of the subject increased rapidly, but it was not until the discovery of the *Treponema pallidum* as the infecting organism causing the disease that the great importance of vascular syphilis came to be fully realized. It is probably the most common cause of disease of the arteries, and of the heart it is at least only second to rheumatism. Aneurism occurring before middle life is nearly always due to syphilis, and very often after also, if we exclude the later years of life. In many cases no history of infection, or of symptoms due to it can be obtained. It is of great importance to be fully alive to this possibility in all cases, even in those with a history of rheumatism. The Wassermann test may settle the matter. If there is syphilis in other structures, or the existence of disease at least frequently due to syphilis, such as tabes dorsalis, the syphilitic nature of the cardiac or arterial disease may usually be taken for granted.

Syphilis of the heart shows itself as gummata and arteritis, the latter much most frequently. Gummata form chiefly in the wall of the left ventricle and the interventricular septum. Around the gummata and in the tissue supplied by the affected branches of the coronary arteries varying degrees of myocarditis occur; probably the changes are degenerative rather than inflammatory and due to the diminution in the blood supply owing to the sclerosis of the arteries. Fibrosis follows in any case. The aortic valves are

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frequently affected and may show marked thickening, and deformity.

In congenital syphilis, myocarditis appears from recent investigations to be of frequent occurrence. Dr. Alfred Scott Warthin has described a striking series of twenty-two cases. (*Trans. Assoc. Amer. Physicians*, vol. xxv., page 580). In several cases there was sudden death. There may be no signs or symptoms to indicate the heart disease, and no evidences of syphilitic infection may be found elsewhere at autopsy. In young infants there was found diffuse interstitial myocarditis containing many spirochætes. In some the diseased condition was evident only on careful microscopic examination. In those surviving, other infections of the heart may occur and coronary sclerosis follow later. Various forms of maldevelopment may be associated with the condition. In one case, the oldest, the father, was far advanced in tabes dorsalis.

The aorta in common with the cerebral and coronary arteries is very liable to luetic infection. Its resistance to the infection is low, probably because of the strain of arterial pressure and its rich vascular supply by which it is invaded by many spirochetes. Only in a minority of cases have there been recognized symptoms of syphilis and usually no history of infection, therefore there has been little if any treatment as a rule. Infection of the aorta may occur at any time, even within a few months after the initial lesion, and early prove fatal from rupture of an aneurism. Some writers believe that the infection of the aorta probably occurs in most cases within the first year. This is not to be wondered at, seeing that the organism is borne by the blood stream to which it gains access early after the primary infection.

The infection of the aorta apparently always begins about the terminals of the vasa vasorum in the middle coat, and extends thence to the internal and external coats and often to the periarterial tissue in which possibly gummata always have their origin.

The lesions in the aorta are usually quite characteristic, consisting in the early stage of gelatinous-looking plaques or patches on the inner surface caused by infiltration and thickening of the intima. These may be confined to the immediate neighbourhood of the root; but they may be found also in any part of the aorta and larger vessels. Later they become pale or of a bluish tint and show fibrous-looking depressions of various sizes and shapes, often with linear and irregular contracted scars. On section they are always found associated with disease of the overlying middle and external coats, in which there is infiltration about the vasa vasorum, whose

walls, both arterial and venous, show marked sclerosis. In these infiltrated areas giant cells are found; these areas are in fact commencing gummata. The elastic tissue is destroyed quite early and replaced by this gummatous formation. In many cases the spirochætes are found in these areas. These changes weaken the wall of the artery and constitute the first step in the production of aneurism.

Aortitis occurs also in children who have congenital lues, the anatomical changes resulting being identical with those in the adult (*Amer. Jour. Med. Sci.*, March, 1915, 450).

Symptoms: Syphilitic lesions of the heart and aorta produce symptoms identical with those arising from lesions in the same parts from other causes. The invasion of the auriculo-ventricular bundle by a gumma, or fibrosis secondary to coronary arteritis, is probably the most frequent cause of heart-block. Præcordial distress is common, and so is angina pectoris in cases in which there is sclerosis of the aorta and heart.

These symptoms occurring in early life without a history of rheumatism are indicative of syphilis, especially if the heart is not enlarged and the blood pressure not increased. The Wassermann test may confirm the diagnosis.

Aneurism of the aorta in early life owes its origin in nearly all cases to syphilis; even in later life it is frequently the cause. The aneurism is usually latent in the early stages. Later, pressure symptoms are common, such as pain in the distribution of one or more intercostal nerves, often for a long period and of variable intensity, an increased area of dullness, uniformity of the second heart sound all over the surface of the aneurism which is in contact with the chest wall, first irritation and later paralysis of a vocal cord, etc. The fluoroscope may show the shadow of the mass which may be seen in some cases to pulsate slightly. Even small aneurisms may produce dangerous pressure effects. Such was the case of a young negro girl reported by Winternitz (*Johns Hospital Bulletin*, 1913, vol. xxiv, 212); a small aneurism at the root of the aorta caused sudden closure of a coronary artery proving fatal within twenty-four hours.

Treatment: Next to prophylaxis early, vigorous and persistent treatment is of the greatest importance. Such treatment should cure every case. It is important to keep before our minds that the disease is caused by an infecting organism, the *Treponema* or *spirochæta pallidum*, and that it can be destroyed in the blood and tissues by *mercury*, and by *arsenic* given in the form of *diarsenol*. The treatment should be continued until we are assured the organ-

isms are all destroyed as shown by the Wassermann test. Even after the test gives no reaction the treatment should be continued for several months less vigorously, with gradually lengthening intervals between the courses, and the test applied at intervals to ensure the continued absence of the reaction. At the same time the general health should be maintained in the best possible condition. If such a course were pursued in every case there would be in time no syphilis nor cardio-vascular disease arising from it. The fact should also be emphasized that iodides in any form have no effect on the virus of syphilis; they only affect the exudate arising from it; in this respect they are of great benefit, even in the early stages.

After the later signs of the disease manifest themselves the same course of treatment should be carried out and with the greatest possible efficiency. With the giving of mercury and diarsenol to destroy the spirochæte, and iodide of soda or potash to promote absorption of any exudate that may have formed, the outlook in earlier cases is good, and even in late cases it is not hopeless; there will be improvement in most of the latter and they may be restored to live a comfortable and useful life.

The prophylaxis of the disease does not come within the scope of this paper. It is a matter of the greatest importance to the public health of the country as the number of the infected is increasing rapidly. Many of the immigrants are infected and many of their children show the evidences of the disease. Those people are a grave menace to the communities in which they settle. They constitute a considerable proportion of our hospital population, especially in the larger cities, and are therefore a great burden on our charitable funds. The matter calls for action by the government, as it is quite as important that those infected with syphilis, as with tuberculosis, be excluded from the country.